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[Image PDF (232K)] [References]

Uptake of aluminum amino acid complexes by cultured astrocytes

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Abstract:
The form by which Al enters brain cells as well as the intracellular consequences of Al in relation to neurodegenerative diseases remains unresolved. In this report, Al was differentially taken up from Al amino acid complexes by primary culture of cortical astrocytes. Aluminum uptake from different amino acid complexes in the presence and absence of the respective amino acid transporter blockers were compared. The results indicate that none of the amino acid transporter blockers, as well as ouabain, employed in the present study apparently inhibited the uptake of Al. There is a possibility that passive diffusion, influenced by concentration gradient and exposure time, is a major mechanism involved in the Al transport in the forms employed here. The apoptotic effect of Al amino acid complex on astrocytes was also confirmed in the present study with evidence of nuclear shrinkage and chromatin condensation that occurred in more than 20% of the cells, as early as 3 days and also at concentrations as low as 0.0125 mM.

Key words: aluminum uptake, apoptosis, astrocyte, Hoechist33258 dye, glutamate and glycine transporters

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